WHAT IS CLAIMED IS:

1. A power control system comprising:

a gain control stage configured to amplify an input signal to produce an amplified signal;

a power detector coupled to an output of the gain control stage, the power detector to detect a ramp of the amplified signal and to provide an indication of the ramp; and

a controller coupled to the power detector and the gain control stage, the controller configured to adjust a supply or control voltage to the gain control stage responsive to the indication of the ramp to cause the supply or control voltage to change as the ramp varies from a predetermined ramp, wherein the predetermined ramp comprises a desired waveform curve modified by a required power level.

2. The power control system, as recited in Claim 1, wherein the required power level comprises a power versus time mask and the desired waveform curve is a raised cosine wave.

3. The power control system, as recited in Claim 1, wherein the required power level comprises a mask according to a predefined power versus time specification and a transient power specification.

4. The power control system, as recited in Claim 1, wherein the voltage is one of a supply voltage and a control voltage

5. The power control system, as recited in Claim 1, wherein the predetermined ramp is independent of operating conditions of the power control system.

6. The power control system, as recited in Claim 5, wherein the operating conditions comprise a power input level to an amplifier stage, temperature, frequency band of operation, and a battery voltage level.

7. The power control system, as recited in Claim 1, the controller comprising:
an error squaring unit; and
an adaptive filter coefficients calculation unit; and
an adaptive filter having multiple taps coupled to the adaptive filter coefficients calculation unit;
wherein the ramp of the amplified signal is compared to the predetermined ramp producing an error term;
wherein the adaptive filter coefficients calculation unit uses the error term to calculate and adjust one or more of the multiple taps of the adaptive filter;
wherein an output of the adaptive filter is fed into a loop filter that accumulates the output signal.

8. The power control system, as recited in Claim 7, wherein the adaptive filter coefficients calculation unit utilizes a least mean square (LMS) adaptive algorithm.

9. The power control system, as recited in Claim 7, wherein the adaptive filter coefficients calculation unit utilizes a recursive least squares algorithm.

10. The power control system, as recited in Claim 7, wherein the output of the adaptive filter converges to zero.

11. The power control system, as recited in Claim 7, wherein an output of the filter is given by the equation $E_K W_{1K} + E_{K-1} W_{2K};+ \ldots + E_o W_{NK}$ where N is an integer representing the length of the filter;
wherein W_{K+1} is $W_K + 2\mu E_K^2$;
wherein μ is a convergence term;
wherein W_K is initially 0; and
wherein E_K is the error term.

12. The power control system, as recited in Claim 7, further comprising:
an activity detection circuit for producing an activity output indicating a detection of activity; wherein the activity output selects between a null

signal when activity is not detected and the predetermined ramp when activity is detected to compare with the ramp of the amplified signal.

13. The power control system, as recited in Claim 7, further comprising a voltage control circuit coupled between the controller and the gain control stage, wherein the controller produces a control signal responsive to the error term; the voltage control circuit processing the control signal to produce the supply voltage.

14. The power control system, as recited in Claim 1, further comprising:
a loop filter coupled to the output of the controller for filtering an output of the controller using a fixed loop bandwidth, wherein the fixed loop bandwidth is independent of operating conditions, the operating conditions including variations of analog circuit elements over temperature, supply voltage, frequency band of operation.

15. The power control system, as recited in Claim 1, wherein the controller controls a ramp up of the amplified signal.

16. The power control system, as recited in Claim 1, wherein the controller controls a ramp down of the amplified signal.

17. A method of amplifying a radio frequency (RF) signal, the method comprising:

amplifying the RF signal with a gain control stage to produce an amplified signal;

detecting a ramp of the amplified signal;

comparing the ramp of the amplified signal to a predetermined ramp producing an error difference, wherein the predetermined ramp comprises a desired waveform curve modified by a required power level;

dynamically adjusting multiple taps of an adaptive filter based on the error difference signal producing a control signal;

filtering the control signal with a loop filter that has a fixed loop bandwidth producing a filtered control signal; and

controlling a control voltage of the gain control stage based on the filtered control signal.

18. The method, as recited in Claim 17, wherein the required power level comprises a power versus time mask and the desired waveform curve comprises a raised cosine wave.

19. The method, as recited in Claim 17, wherein the required power level comprises a mask according to a predefined power versus time specification and a transient power specification.

20. The method, as recited in Claim 17, wherein the predetermined ramp is independent of operating conditions of a power control system.

21. The method, as recited in Claim 20, wherein the operating conditions comprise a power input level, temperature, and a battery voltage level.

22. The method, as recited in Claim 17, wherein adjusting the multiple taps of the adaptive filter is according to a least mean square (LMS) adaptive algorithm.

23. The method, as recited in Claim 17, wherein adjusting the multiple taps of the adaptive filter is according to a recursive least squares algorithm.

24. The method, as recited in Claim 17, wherein the control signal converges to zero.

25. The method, as recited in Claim 17, wherein an output of the adaptive filter is given by the equation $E_K W_{1K} + E_{K-1} W_{2K};+ \ldots + E_O W_{NK}$ where N is an integer representing the length of the filter;

wherein W_{K+1} is $W_K + 2\mu E_K^2$;

wherein μ is a convergence term;

wherein W_K is initially 0; and

wherein E_K is the error difference.

26. The method, as recited in Claim 17, further comprising:

detecting activity of the amplified signal and producing an activity output;

wherein the output is configured to select between a null signal when activity is not detected and the predetermined ramp when activity is detected to compare with the ramp of the amplified signal.

27. The method, as recited in Claim 17, further comprising:

filtering the control signal using a loop filter with a fixed loop bandwidth,

wherein the fixed loop bandwidth is independent of operating conditions of a power control system.

28. The method, as recited in Claim 27, wherein the operating conditions comprise a power input level, temperature, frequency band of operation, and a battery voltage level.

29. The method, as recited in Claim 17, wherein the controlling the control voltage controls a ramp up of the amplified signal.

30. The method, as recited in Claim 17, wherein the controlling the control voltage controls a ramp down of the amplified signal.